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Kenya Power

DIGITAL COATING THICKNESS TESTER - SPECIFICATION

A Document of the Kenya Power & Lighting Co. Ltd.
October 2016

CONTENTS

0.1 Circulation List

COPY NO.	COPY HOLDER
1	Manager Standard
2	Electronic copy (pdf) on Kenya Power server (http://172.16.1.40/dms/browse.php?fFolderId=23)

REVISION OF KPLC STANDARDS

In order to keep abreast of progress in the industry, KPLC standards shall be regularly reviewed. Suggestions for improvements to approved standards, addressed to the Manager, Standards department, are welcome.

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0.2 Amendment Record

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
0	2016-10-17	New Issue	Nancy Wairimu	Dr. Eng. Peter Kimemia

FOREWORD

This specification has been prepared by the Standards Department in collaboration with Quality Control Section (Logistics) both of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for Digital Coating Thickness Tester.

The specification stipulates the minimum requirements for Digital Coating Thickness Tester acceptable for use in the company.

The following are members of the team that developed this specification:

Name	Division
Simon Kimitei	Supply Chain and Logistics
Nancy Wairimu	Infrastructure Development

1. SCOPE

1.1. This specification is for Digital Coating Thickness Tester for use in measuring coating thickness on accessories and equipment.

1.2. The specification also covers requirements, inspection and tests of the instruments and their accessories as well as schedule of Guaranteed Technical Particulars.

2. NORMATIVE REFERENCES

The following standards contain provision which through reference in this text constitute provisions of this specification. For dated editions the cited edition will apply; for undated editions the latest edition of the referenced document shall apply.

ISO 2178: Non-magnetic coatings on magnetic substrates – Measurement of coating thickness – Magnetic method.

ISO 19840: Paints and varnishes -- Corrosion protection of steel structures by protective paint systems -- Measurement of, and acceptance criteria for, the thickness of dry films on rough surfaces

IEC 61010: Safety requirements for electrical equipment for measurement, control and laboratory use.

IEC 61326: Electrical equipment for measurement, control and laboratory use – EMC requirements.

IEC 60529: Degrees of protection provided by enclosures

3. DEFINITIONS AND ABBREVIATIONS

For the purpose of this specification the abbreviations given in the reference standards shall apply.

4. REQUIREMENTS

4.1 SERVICE CONDITIONS

The Digital Coating Thickness Tester shall be suitable for use outdoors in tropical areas with the following climatic conditions:

a) Altitudes of up to 2200m above sea level;
b) Humidity of up to 95%;
c) Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C
d) Pollution: Design pollution level to be taken as "Heavy" (Pollution level III) and "Very Heavy" (Pollution level IV) for coastal applications in accordance with IEC 60815.

4.2. DESIGN AND CONSTRUCTION

4.2.1. The Digital Coating Thickness Tester shall be designed for measurement of zinc coating thickness on galvanized steel and iron items. It shall satisfy the requirements of applicable ISO, IEC, Kenya Standards and this specification.

4.2.2. It shall be suitable for measuring the level of galvanizing on galvanized threaded work including bolts & nuts, galvanized steel structures (angle, flat & channel sections) and external surfaces of galvanized steel pipes.

4.2.3. The Digital Coating Thickness Tester shall be a portable electronic instrument that uses a temperature-compensated magnetic transducer to measure the magnetic flux changes that occur when the probe (a magnet) is separated from a ferrous metal substrate by a non-magnetic coating such as zinc or paint.

4.2.4. It shall have specialized integral probes and separate gauges for use on both ferrous and non-ferrous substrates. The probe connections shall be secure for improved durability.

4.2.5. The output signal from the probe shall be proportional to the distance of separation and therefore to coating thickness. The probe signal shall be amplified and indicated on a meter calibrated to show coating thickness in µm (on an LCD screen).

4.2.6. The Digital Coating Thickness Tester shall have an accuracy of ±1%. It shall have an easy to read colour screen display to provide easy reading visibility at all angles, both indoors and outdoors. The screen shall be high contrast LCD and size of at least 60mm.

4.2.7. It shall be capable of minimizing errors in reading caused by the magnetic permeability, dimensions, surface finish and curvature of the article being tested.

4.2.8. The Digital Coating Thickness Tester shall be calibrated to relevant standards. The instrument shall be complete with relevant components necessary for calibration.

4.2.9. It shall have a reading rate of more than 70 readings per minute. It shall be able to measure accurately on smooth rough thin and curved surfaces and have high and low reading limit indicators.

4.2.10. It shall be factory calibrated for immediate use with measurement capability to ± 1% and increased reading resolution for thin coatings.

4.2.11. The instrument shall be supplied complete with all relevant accessories including carrying case, charger (230V 50Hz) and manuals.

4.2.12. The Digital Coating Thickness Tester shall have USB and relevant software and data output. It shall have easy to use menus in English language with alphanumeric batch identification capacity. The software shall be compatible with Windows 7.

4.2.13. Measurements from the tester shall be downloadable to a computer using the software supplied with the tester.

4.2.14. The tester shall have internal memory for readings among other parameters. The memory shall not be erased by the action of removing the battery.

4.2.15. The tester shall also have the following ratings/features:

Table 1: Ratings and Features

No	Item/Feature	Requirement
1.	Design	Rugged, dust and water proof equivalent to IP 64 as per IEC 60529.
2.	Display	Sealed heavy duty scratch and solvent resistant, impact resistant and easy to use in harsh environments.
3.	Buttons	Large buttons ideal for gloved hands.
4.	Drop test	Drop tested to a height of 2m and withstand the impact
5.	Tester thickness measurement range	0 to 1500 µm.
6.	Minimum substrate thickness for ferrous materials	0.3mm
7.	Power	Rechargeable batteries, complete with 230V AC Charger
8.	Auto power off	Approximately 15 seconds
9.	Response time	1 second.

No	Item/Feature	Requirement
10.	Display	3½ digit liquid crystal display
11.	Resolution	0.1μm: 0-100μm, 1μm: 100-1500μm
12.	Probe design (straight & angle measurements):	
	a) Minimum convex surface diameter	4mm
	b) Minimum concave surface diameter	25mm
	c) Minimum sample diameter	4mm
13.	The tester shall have the following indicators:	ON/OFF
		Battery life indicator
		Indicator for out of limits reading
		Calibration indication
		Units of measurement
		Date & time
		Measurement mode
		Low power indication: should display when the battery voltage drops below the operating level

5. TESTS REQUIREMENTS

The measurement equipment shall be inspected and tested in accordance with the requirements of this relevant standards and provision of this specification.

6. MARKING, LABELLING AND PACKING

6.1 The following information shall be marked legibly and in a permanent manner on the Digital Coating Thickness Tester:

a) The manufacturer's name;
b) The type reference number;
c) The serial number;
d) The instructions for handling and use (in the English Language).
e) The words ''PROPERTY OF KPLC''

6.2 The Digital Coating Thickness Tester shall be packed in a manner so as to protect it from damage during transportation and storage

APPENDICES

A: TESTS AND INSPECTION (NORMATIVE)

A.1 It shall be the responsibility of the supplier to test or to have all the relevant tests performed.

A.2 Copies of previous test certificates by a third party testing laboratory accredited to ISO/IEC 17025 shall be submitted with the offer for evaluation. A copy of the accreditation certificate for the testing laboratory shall also be submitted with the tender (all in English Language). Any translations of certificates and test reports into English language shall be signed and stamped by the Testing Authority.

A.3 Test certificates and calibration certificates for the Digital Coating Thickness Tester to be supplied shall be submitted to KPLC for approval before shipment/delivery of the goods.

A.4 On receipt of the Digital Coating Thickness Tester, KPLC will inspect them and may perform or have performed any of the relevant tests in order to verify compliance with the specification. The supplier shall replace without charge to KPLC, any Digital Coating Thickness Tester which upon examination/inspection, test or use fail to meet any of the requirements in the specification.

B: QUALITY MANAGEMENT SYSTEM (NORMATIVE)

B.1 The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the low voltage measurement instruments physical properties, tests and documentation, will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001:2008.

B.2 The Manufacturer's Declaration of Conformity to applicable standards and copies of quality management certifications including copy of valid and relevant ISO 9001: 2008 certificate shall be submitted with the tender for evaluation.

B.3 The bidder shall indicate the delivery time of the items, manufacturer's monthly & annual production capacity and experience in the production of the type and size of items being offered. A detailed list & contact addresses (including e-mail) of the manufacturer's previous customers for similar type of the low voltage measurement instruments sold in the last five years as well as reference letters from at least four of the customers shall be submitted with the tender for evaluation.

C: DOCUMENTATION AND DEMONSTRATION (NORMATIVE)

C.1 The bidder shall submit its tender complete with technical documents for tender evaluation. The technical documents to be submitted (all in English language) for tender evaluation shall include the following:

a) Fully filled clause by clause guaranteed technical particulars (GTP) signed by the manufacturer;
b) Copies of the Manufacturer's catalogues, brochures, drawings and technical data;
c) Sales records for the last five years and at least four customer reference letters;
d) Details of manufacturing capacity and the manufacturer's experience;
e) Copies of required type test reports by a third party testing laboratory accredited to ISO/IEC 17025;
f) Copy of accreditation certificate to ISO/IEC 17025 for the third party testing laboratory;
g) Manufacturers letter of authorization, ISO 9001:2008 certificate and other technical documents required in the tender.
h) Operating instructions:

C.2 The successful bidder (supplier) shall submit the following documents/details to The Kenya Power & Lighting Company for approval before manufacture:

a) Fully filled clause by clause guaranteed technical particulars (GTP) signed by the manufacturer;
b) Design Drawings with details of Digital Coating Thickness Tester to be manufactured for KPLC.
c) Quality assurance plan (QAP) that will be used to ensure that the design, material; workmanship, tests, service capability, maintenance and documentation will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001.
d) All documentation necessary for safety of the equipment.

C.3 The successful bidder shall demonstrate to KPLC Staff (in Nairobi) the use of the Digital Coating Thickness Tester and explain the features that guarantee excellent service. This shall be done at the drawings approval stage.

C.4 Each measuring equipment shall be backed up with a 3 year warranty.

D: GUARANTEED TECHNICAL PARTICULARS

To be filled and signed by the Manufacturer and submitted together with relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records for previous five years, four customer reference letters, details of manufacturer's capacity and experience; and copies of complete type test certificates and test reports for tender evaluation, all in English Language)

Tender No. .....

Clause number		**Bidder's offer** (indicate full details of the offered tester for each requirement of the specification)
Item Name and Model Number		State
Manufacturer's name and address		State
Country of manufacture		State
Bidder's Name & Address		State
1	Scope	State
2	Applicable Standards	State
3	Terms & Definitions	State
4.1	Service Conditions	State
4.2	Design & Construction	State
4.2.1	Applicable Standards	State
4.2.2	Application	State
4.2.3	Mode of operation	State
4.2.4	Probes and gauges	State
4.2.5	Nature of output signal	State
4.2.6	Accuracy ±1%	State
	Colour display screen easy to read at all angles	State
	Display screen usable indoors and outdoors Screen type	State
4.2.7	Capable of minimizing errors in reading	State
4.2.8	Calibrated to relevant standards	State
	Instrument delivered complete with relevant components necessary for calibration	State
4.2.9	Reading rate > 70 readings per minute	State
	Have high and low reading limit indicators	State
4.2.10	Factory calibrated	State
4.2.11	Supplied complete with all relevant accessories including carrying case, charger (230V 50Hz) and manuals	State
4.2.12	Data output: USB and relevant software	State
	Easy to use menus in English language	State
	Software shall be compatible with Windows 7	State

Clause number				Bidder's offer (indicate full details of the offered tester for each requirement of the specification)
4.2.13	Measurements to be downloadable to a computer			State
4.2.14	Have internal memory			State
	Memory not erased if battery removed			State
4.2.15	Ratings/features			
	No	**Item/Feature**	**Requirement**	
	1.	Design	Rugged, dust and water proof equivalent to IP 64 as per IEC 60529.	State
	2.	Display	Sealed heavy duty scratch and solvent resistant, impact resistant and easy to use in harsh environments.	State
	3.	Buttons	Large buttons ideal for gloved hands.	State
	4.	Drop test	Drop tested to a height of 2m and withstand the impact	State
	5.	Tester thickness measurement range	0 to 1500 µm.	State
	6.	Minimum substrate thickness for ferrous materials	0.3mm	State
	7.	Power	Rechargeable batteries, complete with 230V AC Charger	State
	8.	Auto power off	Approximately 15 seconds	State
	9.	Response time	1 second.	State
	10.	Display	3½ digit liquid crystal display	State
	11.	Resolution	0.1µm: 0-100µm, 1µm: 100-1500µm	State
	12.	Probe design (straight & angle measurements):		
		a) Minimum	4mm	State

Clause number				Bidder's offer (indicate full details of the offered tester for each requirement of the specification)
			convex surface diameter	
		b)	Minimum concave surface diameter	25mm	State
		c)	Minimum sample diameter	4mm	State
	13.		The tester shall have the following indicators:	ON/OFF	
				Battery life indicator	State
				Indicator for out of limits reading	State
				Calibration indication	State
				Units of measurement	State
				Date & time	State
				Measurement mode	State
				Low power indication: should display when the battery voltage drops below the operating level	State
6	Marking, Labeling and Packing				
6.1	Marking and Labeling				State
6.2	Packing				State
A	Test and inspection				
A.1	Responsibility of carrying out tests				State
A.2	Copies of Type Test Reports submitted with tender				Provide
A.3	Test reports to be submitted by supplier to KPLC for approval before shipment				Provide
A.4	Inspection at the stores				State compliance
	Replacement of rejected instruments				State
B	Quality Management System				
B.1	Quality Assurance Plan				Provide
B.2	Copy of ISO 9001:2008 Certificate				Provide

Clause number		**Bidder's offer** (indicate full details of the offered tester for each requirement of the specification)
B.3	Manufacturer's experience	Provide
	Manufacturing Capacity (units per month)	
	List of previous customers	
	Customer reference letters	
C	Documentation and Demonstration	
C.1	Documents submitted with tender	Provide
C.2	Documents to be submitted by supplier to KPLC for approval before manufacture	Provide
C.3	Demonstration	State compliance
C.4	Warranty	State
	Statement of compliance to specification	State compliance

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Manufacturer's Name, Signature, Stamp and Date